AMENDMENTS TO THE DRAWINGS

The drawings are amended as shown in redline.

REMARKS

Claims 1-14, and 16-23 are pending for the Examiner's review and consideration. Of these claims, claims 1, 3, and 14 are presently amended, and claims 18-23 are newly added. Claim 15 has been cancelled without prejudice.

The drawing has been amended by placing the labels on the appropriate axes of the graph for improved clarity. This change is supported, for example, in the tables relating the D/S ratio to the rms roughness in the original drawing and in the description of the drawing. A formal Replacement Sheet of Fig. 1 is submitted herewith for replacement of the previous drawing sheet filed with the application. The specification was also amended to provide the reference numerals 10 and 12, which were included in the originally filed drawing.

In the office action, claim 15 was rejected under 35 U.S.C. § 112, second paragraph. Since this claim is presently cancelled, this rejection is now moot.

Claims 1-5 were rejected under 35 U.S.C. § 102(b) over Hasima, and claims 6-17 were rejected under 35 U.S.C. § 103(a) over Hasima in view of Li. The Office Action includes the argument that Hasima inherently discloses using a predetermined diamond/silica volume ratio, and that polishing is performed to obtain a smoother surface for bonding to polished surfaces.

Claim 1 is directed to a method for providing a smooth wafer surface, in which an abrasive mixture is formulated by mixing diamond particles and silica particles in a solution. The formulation is sufficient for smoothing a polar material surface, and the diamond/silica volume ratio is selected to control and obtain a desired surface roughness. Claim 21 further recites that the diamond/silica volume ratio is selected to substantially minimize the roughness of the polished surface, and claim 22 uses similar language.

As disclosed in the present application, for example in Fig. 1 and the description thereof, a diamond/silica volume ratio that is either too low or too high surprisingly results in a higher rms roughness than a diamond/silica volume ratio in a beneficial range that is disclosed which is present as a dip in the graph. As seen from the application, this is not a matter of mere optimization. Hasima does not provide any indication or suggestion that the diamond/silica ratio can be used to control the roughness. Instead,

One of ordinary skill in the art would not find any teaching or suggestion on how to provide the claimed smoothness for a surface that was provided after a layer transfer therefrom, by polishing based on the teaching of Hasima. Claims 6 and 7 are also certainly not taught or suggested by Hasima, and they recite the preferred range that the inventors have discovered provide the best improvement in roughness, also as disclosed in the description of Fig. 1.

Claim 8 defines the preferred grain size that is also not taught or suggested in Hasima, and which the inventors have found has an important effect on the ultimate roughness.

In combination with the recited ratios and particle sizes, the specifics of the polishing recited in claims 10-13 are not an obvious combination in further view of Li, since these parameters of the polishing operation can have a significant effect on the roughness that is provided and are dependent on the type of material used and the type of material polished. The present is not a predictable art from which one of ordinary skill in the art would merely pick and choose parameters from different polishing teachings and know that the final polishing would be improved.

In fact, the solution that Hasima used was very inefficient, since it was only able to obtain a removal rate of about one atomic layer per minute. (Hasima at 1160.) In this regard, claim 14 recites that the polishing is performed for about 30 minutes to 2 hours, and that the surface that is polished is provided by transferring a layer from the wafer to expose said surface.

Claims 18 and 23 recite that an ultrafinishing polishing is performed on the polished surface to prove and prepare the surface for molecular bonding to another polished substrate surface. Claim 19 further specifies that the ultrafinishing polishing comprises polishing the surface with pure colloidal silica. There is no teaching or suggestion of this in Hasima, since Hasima recites that the diamonds were directly bondable to fused silica, and provides no motivation or suggestion to use a further preparation step. (Hasima at 1160.) Consequently, these claims are also patentably distinct from the references of record. These claims are supported, for example, in the first full paragraph on page 7 of the application.

Claims 20 and 22 also recite that the surface is provided by transferring a layer from the wafer to expose such surface. As known in the art, such transfer operations result in

surfaces with certain typical roughnesses and surface qualities, and the recited polishing methods have been found to be particularly advantageous with these surfaces. There is no teaching to use the present polishing method with surfaces provided in this manner. These claims are also not anticipated or obvious over the references, and they are supported, for example, in the second full paragraph on page 7 of the application.

It is believed that the entire application is presently in condition for allowance. Should any issues remain, a personal or telephonic interview is respectfully requested to discuss the same in order to expedite the allowance of the application.

Respectfully submitted,

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Date

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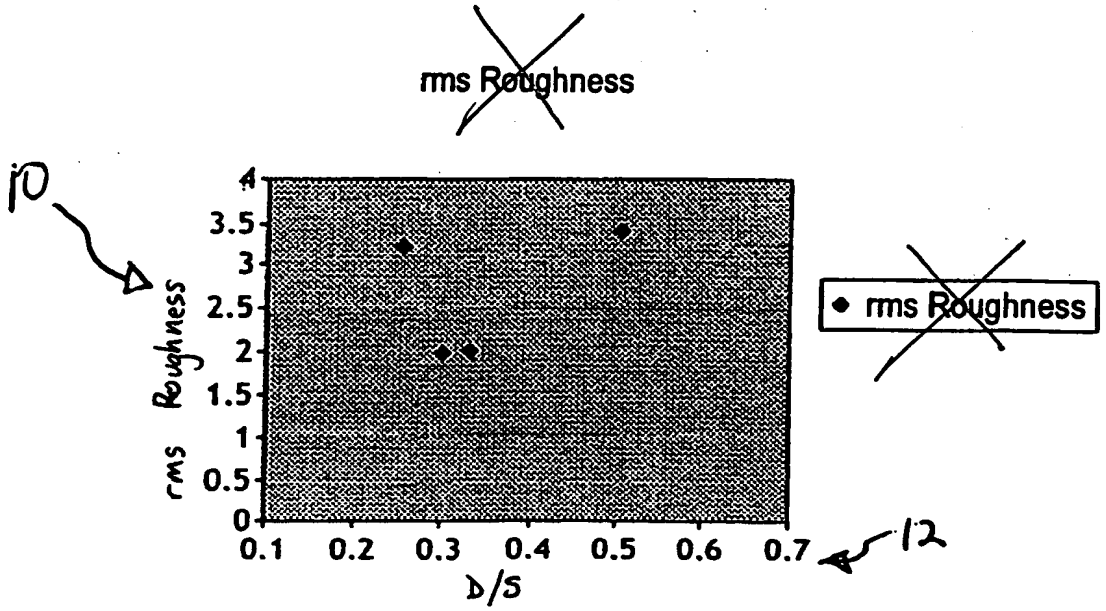
ANNOTATED MARKED-UP VERSION



D/S	rms Roughness
0.25	3.2
0.33	2
0.3	2
0.5	3.4
1	3.1

FIG. 1